IS 7129 (1992): Potassium carbonate, anhydrous [CHD 1: Inorganic Chemicals]

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भारतीय मानक

पोटेशियम कार्बोनेट, निर्जल—विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

POTASSIUM CARBONATE, ANHYDROUS — SPECIFICATION

(First Revision)

UDC 661·832·622

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 1992

Price Group 4

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Acids, Alkalies and Halides Sectional Committee had been approved by the Chemical Division Council.

Potassium carbonate is used as a dehydrating agent and for making other potassium salts, such as chlorates and chromates. It also finds its use in ceramics, explosives, fertilizers, mineral water, tanning, electroplating, shampoo preparations, process engraving and lithography, soft soaps, textile dyeing, bleaching and finishing oil, and photography.

This standard was originally published in 1973. In this revision a new requirement for sodium along with the relevant test method has been incorporated. An alternate method for chloride determination has been included, while some modifications have been made in other test methods also.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

POTASSIUM CARBONATE, ANHYDROUS — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for potassium carbonate, anhydrous.

2 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

IS No.	*Title*
323 : 1959	Rectified spirit (*revised*)
1070 : 1977	Water for general laboratory use (*second rerision*)
4161 : 1967	Nessler cylinders
4905 : 1968	Methods for random sampling

3 GRADES

The material shall be of two grades, namely:

a) Pure grade, and

b) Technical grade.

4 REQUIREMENTS

4.1 Description

The material shall be a white deliquescent crystalline powder.

4.2 The particle size for the granular form shall be as agreed to between the purchaser and the supplier.

4.3 The material shall also comply with the requirements given in Table 1 when tested according to the methods prescribed in Annex A. Reference to the relevant clauses of Annex A is given in col 5 of the table.

Table 1 Requirements for Potassium Carbonate, Anhydrous

(*Clause* 4.3)

Sl No.	Characteristic	Requirement (on Received Basis)		Method of Test (Ref to Cl No. in Annex A)
		Pure Grade	Technical Grade	
(1)	(2)	(3)	(4)	(5)
i)	Total alkalinity (as K_2CO_3), percent by mass, *Min*	98	98	A-3
ii)	Potassium bicarbonate (as $KHCO_3$), percent by mass, *Max*	0·4	0·4	A-4
	OR			
	Free alkali (as KOH), percent by mass, *Max*	0·5	0·5	A-4
iii)	Sulphates (as K_2SO_4), percent by mass, *Max*	0·05	0·2	A-5
iv)	Chlorides (as KCl), percent by mass, *Max*	0·015	0·1	A-6
v)	Matter insoluble in water, percent by mass, *Max*	0·1	0·2	A-7
vi)	Iron (as Fe), percent by mass, *Max*	0·002	0·005	A-8
vii)	Heavy metals (as Pb), percent by mass, *Max*	0·001	—	A-9
viii)	Loss on heating at 150°C, percent by mass, *Max*	1·0	1·0	A-10
ix)	Sodium (as Na), percent by mass, *Max*	1·0	2·0	A-11

4.4 Optional Requirement

The material when intended to be used as dehydrating agent shall be dried at 120°C.

5 PACKING AND MARKING

5.1 Packing

The material shall be packed in moisture-proof bags with LDPE liners, drums or as agreed to between the purchaser and the supplier.

5.2 Marking

The containers shall be marked with the following information:

a) Name and grade of the material;

b) Indication of the source of manufacture; and

c) Net mass of the material.

5.2.1 The containers may also be marked with the Standard Mark.

6 SAMPLING

The procedure for drawing representative samples of the material and their criteria for conformity shall be as prescribed in Annex B.

ANNEX A

[*Clause* 4.3 and *Table* 1]

METHODS OF TEST FOR POTASSIUM CARBONATE, ANHYDROUS

A-1 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070 : 1977) shall be used in tests.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-2 PREPARATION OF SAMPLE SOLUTION

Weigh quickly about 20 g of the sample (accurate to 0·01 g) in a stoppered weighing bottle and dissolve in about 100 ml of water. Filter through a Whatman Filter Paper (No. 530 or 531 or equivalent) and transfer into a 250-ml volumetric flask. Wash thoroughly with water and add the washings to the filtrate. Dilute the resulting solution to 250-ml mark and shake well.

A-3 TOTAL ALKALINITY (EXPRESSED AS K_2CO_3)

A-3.1 Reagents

A-3.1.1 *Standard Hydrochloric Acid* — 1 N and 0·1 N.

A-3.1.2 *Methyl Orange Indicator Solution* — Dissolve 0·1 g of methyl orange in 100 ml of water.

A-3.2 Procedure

Transfer by means of a pipette, exactly 25 ml of the prepared solution (*see* **A-2**) into a 250-ml flask. Add 50 ml of water. Titrate the solution with standard hydrochloric acid (1 N) in the beginning and with (0·1 N) standard hydrochloric acid towards the end point using methyl orange indicator solution. Convert the volume of hydrochloric acid (0·1 N) used to standard hydrochloric acid (1 N).

A-3.3 Calculation

Total alkalinity (as K_2CO_3), percent by mass

$$= \frac{69{\cdot}1\,VN}{M}$$

where

V = volume in ml of converted standard hydrochloric acid (1 N),

N = actual normality of standard hydrochloric acid, and

M = mass in g of the material in the sample solution taken for the test (**A-2**).

A-4 POTASSIUM BICARBONATE AND FREE ALKALI

A-4.1 Reagents

A-4.1.1 *Barium Chloride Solution* — Approximately 1 N, neutral to phenolphthalein.

A-4.1.2 *Sodium Hydroxide Solution* — 0·1 N, free from carbon dioxide.

A-4.1.3 *Standard Hydrochloric Acid* — 0·1 N.

A-4.1.4 *Phenolphthalein Indicator*

Dissolve 0·1 g of phenolphthalein in 60 ml of rectified spirit (conforming to IS 323 : 1959), and dilute with water to 100 ml.

A-4.2 Procedure

Transfer 25 ml of the sample solution (*see* A-2) into a conical flask. Add 10 ml of sodium hydroxide solution followed by 170 ml of barium chloride solution added slowly with constant shaking. Add 0·2 ml (4 drops) of phenolphthalein indicator, stopper the flask, mix the contents thoroughly and let it stand for five minutes. Titrate with the standard hydrochloric acid until the pink colour is discharged.

A-4.3 Calculation

a) Potassium bicarbonate as ($KHCO_3$),

$$\text{percent by mass} = \frac{10\,(10 - V)}{M}$$

when V is less than 10 ml of NaOH added.

b) Free alkali (as KOH), percent by mass

$$= \frac{5{\cdot}6\,(V - 10)}{M}$$

when V is greater than 10 ml of NaOH added

where

V = volume in ml of standard hydrochloric acid used, and

M = mass in g of the material taken for the test.

A-5 DETERMINATION OF SULPHATES

A-5.1 Reagents

A-5.1.1 *Dilute Hydrochloric Acid*

Approximately 10 percent (*v/v*).

A-5.1.2 *Barium Chloride Solution*

Approximately 10 percent (*m/v*).

A-5.2 Procedure

Weigh accurately about 5 g of the material and add 30 ml of dilute hydrochloric acid. Filter, if necessary, and wash the filter paper thoroughly. Heat the solution to boiling and add drop by drop 10 ml of hot barium chloride solution. Boil the solution for 15 minutes and then allow to stand for 4 hours. Filter through a tared Gooch or a sintered glass crucible (G No. 4). Wash the precipitated barium sulphate with hot water till it is free from chlorides and dry io constant mass at about 110°C.

A-5.3 Calculation

Sulphates as (K_2SO_4), percent by mass

$$= 74{\cdot}63 \times \frac{M_1}{M}$$

where

M_1 = mass of barium sulphate, and

M = mass of the material taken for the test.

A-6 TEST FOR CHLORIDES

A-6.1 Two methods are prescribed, one is Nessler cylinder method and the other is volumetric method. In case of dispute Nessler cylinder method shall be the referee method.

A-6.2 Nessler Cylinder Method

A-6.2.1 *Apparatus*

A-6.2.1.1 *Nessler cylinders* — 50-ml capacity.

A-6.2.2 *Reagents*

A-6.2.2.1 *Dilute nitric acid* — Approximately 5 N.

A-6.2.2.2 *Silver nitric solution* — Approximately 5 percent.

A-6.2.2.3 *Standard chloride solution*

Dissolve 0·165 g of sodium chloride, dried at 105 ± 2°C, in water and make up to 1 000 ml. One mililitre of this solution contains 0·1 mg of chloride (as Cl).

A-6.2.3 *Procedure*

Weigh 10·0 g for pure grade or 1·0 g for technical grade of the material into a Nessler cylinder, dissolve in 30 ml of water and add 15 ml of dilute nitric acid followed by 1 ml of silver nitrate solution and dilute to the mark. Carry out a control test in another Nessler cylinder using 7 ml of standard chloride solution for pure grade and 5 ml for technical grade in place of the material and the same quantities of other reagents in the same total volume of the reaction mixture and compare the opalescence produced in two cylinders after two minutes.

A-6.2.3.1 The limit prescribed for chloride shall be taken as not having been exceeded if the turbidity produced in the test with the material is not greater than that produced in the control test.

A-6.3 Volumetric Method

A-6.3.1 *Reagents*

A-6.3.1.1 *Silver nitrate solution* (0·01 N)

Weigh accurately 1·699 g of silver nitrate (AR grade) and dissolve in chloride free water. Add 10 ml of concentrated nitric acid and dilute to 1 000 ml with water. Transfer the solution to a coloured bottle and store in dark place.

A-6.3.1.2 *Potassium thiocyanate solution* (0·01 N)

Weigh accurately 0·971 7 g of potassium thiocyanate (AR grade), dissolve in water and

dilute to 1 000 ml. Standardize this solution with standard 0·01 N silver nitrate solution.

A-6.3.1.3 *Ferric nitrate solution (40 percent)*

Weigh 40 g of ferric nitrate (AR grade) and dissolve in a small quantity of water. Add a few drops of concentrated nitric acid (AR grade) and dilute to 100 ml.

A-6.3.1.4 *Potassium chloride solution (0·02 percent)*

Weigh accurately 0·2 g of potassium chloride (AR grade), dissolve in chloride free water and dilute to 1 000 ml.

A-6.3.1.5 *Concentrated nitric acid*

A-6.3.1.6 *Nitrobenzene*

A-6.3.2 *Procedure*

A-6.3.2.1 Take 10 ml of standard potassium chloride solution (**A-6.3.1.4**) and add about 50 ml of chloride free water. Add 5 ml of concentrated nitric acid and 2 ml of ferric nitrate solution (**A-6.3.1.3**). Add 10 ml of 0·01 N silver nitrate solution (**A-6.3.1.1**) followed by 2 ml of nitrobenzene, stir vigorously and tirate with 0·01 N potassium thiocyanate solution till the faint brick red colour appears. From the consumption of standard silver nitrate solution, calculate the equivalent of potassium chloride content for 1 ml of silver nitrate solution.

Let 1 ml of standard silver nitrate solution = X mg of potassium chloride.

A-6.3.2.2 Weigh 10 g of potassium carbonate sample and transfer to a 250-ml conical flask. Add a few millilitres of water and neutralize with concentrated nitric acid. Add 2 ml of ferric nitrate indicator (**A-6.3.1.3**) and 10 ml of standard silver nitrate solution. Add 2 ml of nitrobenzene and titrate against 0·01 N potassium thiocyanate solution (**A-6.3.1.2**) till brick red colour appears.

A-6.3.3 *Calculation*

Chloride (as KCl), percent by mass

$$= \frac{(10 - V) \times X}{10\,M}$$

where

V = volume in ml of standard potassium thiocyanate solution used in the titration,

X = mass in mg of potassium chloride equivalent to 1 ml of silver nitrate, and

M = mass in g of the material taken for the test.

A-7 DETERMINATION OF MATTER INSOLUBLE IN WATER

A-7.1 Procedure

Weigh accurately 5 to 10 g of the material, transfer it to a 400-ml beaker, add about 200 ml of freshly boiled water, and boil the resulting solution for about 10 minutes. Filter through a tared Gooch crucible or a sintered glass crucible (G. No. 4) and wash the residue with hot water till it is free from soluble salts. Dry the crucible along with the insoluble residue at 110 C and weigh to constant mass.

A-7.2 Calculation

Matter insoluble in water, percent by mass

$$= \frac{M_1}{M} \times 100$$

where

M_1 = mass in g of the residue, and

M = mass in g of the material taken for the test.

A-8 TEST FOR IRON

A-8.1 Apparatus

A-8.1.1 *Nessler Cylinder* — 50-ml capacity (*see* IS 4161 : 1967).

A-8.2 Reagents

A-8.2.1 *Dilute Hydrochloric Acid* — Approximately 5 N.

A-8.2.2 *Ammonium Persulphate*

A-8.2.3 *Potassium Thiocyanate Solution* — Approximately 5 percent.

A-8.2.4 *Dilute Sulphuric Acid* — 10 percent (*v* /*v*).

A-8.2.5 *Standard Iron Solution*

Dissolve 0·702 g of ferrous ammonium sulphate in 10 ml of dilute sulphuric acid and dilute with water to 1 000 ml. Dilute 100 ml of this solution again to 1 000 ml. One millilitre of the diluted solution contains 0·01 mg of iron (as Fe).

A-8.3 Procedure

Weigh accurately, 1·000 g of the material and dissolve in about 20 ml of water. Add about 5 ml of hydrochloric acid and 30 mg of ammonium persulphate, and boil to oxidize the iron. Cool and transfer to a Nessler cylinder, add 5 ml of potassium thiocyanate solution, dilute with water to 50 ml mark and stir well. Carry out a control test using 2 ml of the standard iron solution for pure grade and 5 ml

for technical grade in place of the material and the same quantities of other reagents in the same total volume of the reaction mixture. Compare the colour produced in the cylinders after 5 minutes.

A-8.3.1 The limit prescribed in Table 1 shall be taken as not having been exceeded if the intensity of colour produced in the test with the material is not greater than that produced in the control test.

A-9 TEST FOR HEAVY METALS

A-9.1 Apparatus

A-9.1.1 *Nessler Cylinders* — 50-ml capacity (*see* IS 4161 : 1967).

A-9.2 Reagents

A-9.2.1 *Dilute Hydrochloric Acid* — Approximately 5 N.

A-9.2.2 *Dilute Ammonium Hydroxide Solution* — Approximately 5 *N*.

A-9.2.3 *Potassium Cyanide Solution*

Dissolve 10 g of potassium cyanide in 100 ml of water.

A-9.2.4 *Acetic Acid* — Glacial.

A-9.2.5 *Hydrogen Sulphide Solution*

Saturated and freshly prepared hydrogen sulphide in water.

A-9.2.6 *Standard Lead Solution*

Dissolve 1·60 g of lead nitrate in water and make up the solution to 1 000 ml with water. Dilute 10 ml of this solution to 1 000 ml with water. One millilitre of the diluted solution contains 0·01 mg of lead (as Pb).

A-9.3 Procedure

Weigh 1·000 g of the material and dissolve in 20 ml of water in a Nessler cylinder. Add 5 ml of dilute hydrochloric acid, 10 ml of dilute ammonium hydroxide solution, 1 ml of potassium cyanide solution and dilute to 40 ml. Add 5 ml of hydrogen sulphide solution, dilute to the mark and mix well. Carry out a control test using 1 ml of standard lead solution, 1 ml of acetic acid and the same quantities of other reagents in the same total volume of the reaction mixture. Compare the colour produced in both the cylinders after 5 minutes.

A-9.3.1 The limit prescribed for heavy metals (as Pb) shall be taken as not having been exceeded if any colour produced in the test with the material is not darker than that produced in the control test.

A-10 DETERMINATION OF LOSS ON HEATING AT 150°C

A-10.1 Apparatus

A-10.1.1 *Weighing Bottle*

Approximately 100-ml capacity and 75 mm in diameter, with ground glass stopper.

A-10.1.2 *Electric Oven*

Capable of reaching a temperature of at least 150°C and regulated so as not to exceed a temperature of 170°C.

A-10.2 Procedure

Weigh the weighing bottle previously dried for 30 minutes in the oven controlled at a temperature of 150°C and allowed to cool to room temperature in a desiccator. Spread thin layers of the test portion in the weighing bottle and weigh to the nearest milligram $5 \pm 0{\cdot}1$ g of the sample. Place the weighing bottle with the ground glass stopper slantwise in the oven set at a temperature of 100°C. Gradually heat the sample in the oven from the starting temperature (which should not exceed 100°C) to at least 150 ± 2°C and maintain this temperature for 4 hours. Remove the weighing bottle, place it in a desiccator to cool, and after cooling to room temperature, weigh it again (with stopper in position) to constant mass.

A-10.3 Calculation

$$\text{Loss on heating at 150°C, percent by mass} = \frac{(M_1 - M_2)}{M} \times 100$$

where

M_1 = mass in g of the material and weighing bottle before heating,

M_2 = mass in g of the material and weighing bottle after heating, and

M = mass in g of the material taken for the test.

A-11 DETERMINATION OF SODIUM

A-11.1 Apparatus

A-11.1.1 *Flame Photometer* — equipped with interference filter.

NOTE — Sodium filter to be used should be of preselected or metal filter type, since ordinary sodium filters (for example, gelatine fillers) have only 1 percent selectivity and work properly when the ratio of Na : K is 100 : 1, whereas in potassium carbonate and potassium hydroxide, the ratio is exactly reverse. Hence results with gelatine filter are erratic.

A-11.2 Reagent

A-11.2.1 *Standard Sodium Solution*

Weigh exactly 2·542 g of sodium chloride, dissolve in deionized water and dilute to

1 000 ml in a measuring flask. Dilute 10 ml of this solution to 1 000 ml. 1 ml of the diluted solution contains 0·01 mg of sodium (as Na).

A-11.3 Sample Solution

Dissolve exactly 10 g of the pure grade of material (5 g in case of technical grade) in deionized water and dilute to 1 000 ml in a volumetric flask. Dilute 100 ml of this solution to 1 000 ml in a volumetric flask. Use this solution for galvanometer readings. If needed, further dilute the solution.

A-11.4 Calibration Graph

Take 10, 20, 40, 60 and 80 ml of standard sodium solution in different measuring flasks and dilute to 100 ml with deionized water. Each flask now contains 0·1, 0·2, 0·4, 0·6 and 0·8 mg of sodium per 100 ml. Use these diluted solutions to obtain corresponding galvanometer reading as given in the procedure (**A-11.5.2**) and plot the concentration against galvanometer reading in a rectangular coordination graph. Draw a smooth curve over the points which gives a calibration graph in the range 0·1 to 1·0 mg of sodium per 100 ml.

A-11.5 Procedure

A-11.5.1 Use a flame photometer equipped with atomizer, burner, optical selective device consisting of reflectors, lenses and diaphragms; and measuring instrument consisting of a photocell, an amplifier and a sensitive galvanometer. The galvanometer scale ranges from 0 to 100 divisions which measures the intensity of the radiation transmitted by the element.

A-11.5.2 Insert the sodium filter corresponding to wave-length 767 nm. Light the burner fed by illuminating gas (laboratory gas) and adjust the specified air pressure between 0·5 to 0·7 kg/cm² and maintain the control knob. First spray deionised water and adjust the pointer to zero in galvanometer scale by adjustment knob. Then spray the standard sodium solution and adjust the deflection to maximum (100) by using sensitivity control knob. Again spray deionised water to see that pointer comes to zero; then spray standard solution to indicate 100. Repeat till deionized water reads zero and standard solution reads 100 with the same adjusment during both the operations. Reading zero by deionized water and with the same adjustment 100 by standard solution, indicates that the instrument is now ready for measurement.

A-11.5.3 Without altering the earlier adjustment of the instrument, spray various diluted solutions prepared in **A-11.4** and obtain a calibration graph in the range of 0·1 to 1·0 mg sodium per 100 ml. After washing with deionised water, spray the sample solution and obtain the galvanometer reading. From the graph, read out the corresponding concentration of sodium (say A).

A-11.6 Calculation

$$\text{Sodium (as Na), percent by mass} = \frac{10\,A}{M}$$

where

A = concentration of sodium in mg per 100 ml corresponding to the galvanometer reading (*see* **A-11.5.3**), and

M = mass in g of the material taken for preparing the sample solution.

ANNEX B

(*Clause* 6)

METHODS OF SAMPLING OF POTASSIUM CARBONATE

B-1 GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, storing, preparing and handling test samples, the following precautions shall be observed.

B-1.1 Samples shall not be taken at an open place.

B-1.2 Precaution shall be taken to protect the samples, the sampling instrument and the containers for samples from adventitious contamination.

B-1.3 To draw a representative sample, the contents of each container selected for sampling shall be mixed thoroughly by suitable means.

B-1.4 The sample shall be placed in suitable, clean, dry and air-tight glass containers.

B-1.5 Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling and year of manufacture.

B-2 SCALE OF SAMPLING

B-2.1 Lot

All the packages in a single consignment of

potassium carbonate drawn from a single batch of manufacture shall constitute a lot. If the consignment is declared to consist of different batches, the batches shall be marked separately and the group of packages in each batch shall constitute separate lots.

B-2.1.1 The number of packages (n) to be drawn at random from the lot shall depend upon the size of the lot (N) and shall be in accordance with Table 2.

Table 2 Number of Packages to be Drawn for Sampling

Lot Size (N)	No. of Packages to be Drawn (n)
(1)	(2)
4 to 50	3
51 ,, 100	4
101 ,, 150	5
151 ,, 300	7
301 and above	10

NOTE — When the size of the lot is 3 or less, the number of packages to be drawn and the criterion for judging conformity of the lot to the specification shall be as agreed to between the purchaser and the supplier..

B-2.1.2 These packages shall be selected at random from the lot and in order to ensure the randomness of sampling, a random number table (*see* IS 4905 : 1968) may be used.

B-2.1.3 Samples shall be tested for each lot for ascertaining conformity of the material to the requirements of this specification.

B-3 PREPARATION OF TEST SAMPLES

B-3.1 From each of the packages selected according to **B-2.1.2**, a portion of the material, about 100 g, shall be drawn with the help of a suitable sampling instrument.

B-3.2 Out of these portions, equal quantities of the material shall be taken and mixed thoroughly to form a composite sample of about 300 g. The composite sample shall be divided into three equal parts, one for the purchaser, another for the supplier and the third to be used as a referee sample.

B-3.3 The remaining portion of the material from each package shall be divided into three equal parts, each forming an individual sample. One set of individual samples representing the package shall be marked for the purchaser, another for the supplier and the third to be used as a referee sample.

B-3.4 All the individual samples and the composite sample shall be transferred to separate sample containers. All the containers shall be sealed and labelled with full identification particulars.

B-3.5 The referee test samples consisting of a composite sample and a set of individual samples shall bear the seals of both the purchaser and the supplier. These shall be kept at a place agreed to between the purchaser and the supplier, to be used in case of dispute between the two.

B-4 NUMBER OF TESTS

B-4.1 Tests for total alkalinity shall be conducted on each of the individual samples.

B-4.2 Tests for all other characteristics given under **4.3** shall be performed on the composite sample (*see* **B-3.2**).

B-5 CRITERIA FOR CONFORMITY

B-5.1 For Individual Samples

From the test results for total alkalinity (as potassium carbonate) the average ($\bar{X}$) and the range (R) or $\bar{R}$ shall be computed.

NOTE — Range is defined as the difference between the maximum and minimum of the individual test results. When there are 10 values, they shall be formed into two groups of five each in the same order in which the individual samples are numbered. For each group range shall be calculated and $\bar{R}$ is the average of these two R's.

B-5.1.1 The lot shall be considered satisfactory in respect of the requirement for total alkalinity, as potassium carbonate if ($\bar{X} - 0{\cdot}4\ R$) or ($\bar{X} - 0{\cdot}4\ \bar{R}$) is greater than or equal to 98.

B-5.2 For Composite Samples

The lot shall be considered to have passed in respect of the remaining characteristics tested on the composite test sample, if the test results satisfy the corresponding requirements given under **4**.

B-5.3 The lot shall be considered as conforming to the specification if it satisfies all the criteria given in **B-5.1** and **B-5.2**.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

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BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :	Telephone
Central : Manan Bhavan, 9 Bhadur Shah Zafar Marg NEW DELHI 110002	{331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	87 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	53 38 43
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	235 02 16
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 400093	632 92 95

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